Community Forestry Program

The Community Forestry Program ensures more livable communities through the care and management of trees.

Winter 2010 Newsletter

Special Features

Southern Pine Beetle a Real Pest in New Jersey

Dendroctonus frontalis, commonly known as the Southern Pine Beetle, has been discovered as far north as Monmouth County, New Jersey. According to the NJ State Forest Service, a migration of that expanse is unprecedented. One of the main contributing factors to the exploding beetle population is the lack of consistently freezing temperatures and an unusually warm year in 2010. According to the NJFS, the average temperature was 68.3°F with below-average precipitation. The most effective, though not dependable solution to this far-reaching infestation is at least two years of consistently frigid winters with temperatures steady at or below freezing, according to Professor Jim Lashomb of Rutgers University.

The first indication of beetle-caused mortality is the tree's crown color. Sick and dying trees will fade from green to yellow, red and finally brown as the tree's health continues to decline. This process, depending on the health of the tree when it was first infested may take anywhere from several weeks to a few months. After boring through the tree's bark, the beetles create a unique "S" shaped gallery along the walls of which the female deposits small, pearlescent white eggs. The girdling process takes place when multiple egg-laying galleries cross one another. In addition to this, the southern pine beetle carries a specific blue-stain fungi, which causes clots within the tree's water-conduction tissues, thereby hastening the onset of mortality.

A mature adult southern pine beetle measures approximately 1/8 of an inch, with a rounded hind body segment. After first emerging from the host tree as an adult, the beetle's body is a soft amber hue that quickly hardens to a final shade that varies from dark reddish brown to black. After chewing its hollow exit, the mature beetle flies off to begin a new infestation, at times in the immediate vicinity, though it may fly (cont.)

Southern Pine Beetle, Cont.

for miles to locate a suitable tree for hosting. It is in stressed, less vigorously growing forests that the southern pine beetle thrives, though as its population begins to swell, it's likely that healthy trees will continue to fall to its attack as their migration trail stretches further into New Jersey's pine woodlands. A robust, healthy pine will emit a heavy flow of resin that deftly traps the beetle before it can burrow into the tree's vital layers. If the trees are stressed or are competing for resources, however, they stand volatile to attack and infestation. An additional concern for New Jersey is the potential for wildfire damage resulting from the ever-increasing number of dead trees.

The most successful means through which to suppress the spread of the beetle is to create buffer strips that cripple the beetle's ability to easily locate and infest new trees. By responsibly thinning the forest in infested areas, remaining pines are less susceptible to stress and mortality, thereby lowering the risk for repeated wildfires and effectively curbing the beetle's attack radius.

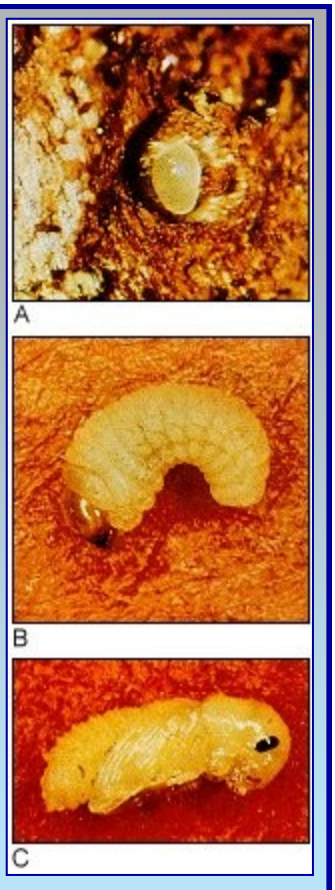
Know Your Beetles:

Indicators of Southern Pine Beetle Infestation

An aerial view of SPB damage and change in crown color. *Photo courtesy of Clemson University.*

Example of blue stain fungus

Adult beetle



Life stages of the southern pine beetle: (A) egg, (B) larva, (C) pupa.

Galleries of southern pine beetle adults with developing larvae.

Southern pine beetle larvae and pupae in shaved outer bark.

Other photos courtesy of the U.S. Forest Service

Stem Girdling Roots

Special thanks to Gary Johnson, University of Minnesota, Dennis Fallon of Xcel Energy and the U.S. Forest Service for their publication of "Stem Girdling Roots: The Underground Epidemic Killing Our Trees"

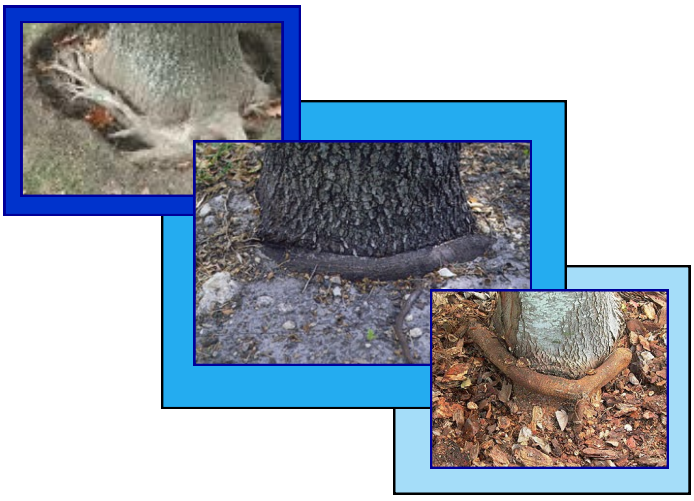
Each year, thousands of trees die prematurely due to dysfunctional root systems. The culprit, known as stem girdling roots or SGR, is an abnormal occurrence when the roots of the tree begin to compress the trunk, severely damaging the tree's ability to conduct nutrients throughout the body of the tree. As the tree grows, the constriction becomes increasingly intense, essentially suffocating the tree from the base upward.

Trees that are weakened by girdled roots may pose a significant safety risk to the neighboring trees and other objects around them. Girdled trees are compromised by their poorly anchored root systems, making them highly susceptible to uprooting by wind or other violent precipitation. They may fall onto homes, vehicles or utility lines, instigating a dangerous and considerably expensive loss to the owner. According to the University of Minnesota, girdled trees may not be readily visible to homeowners or municipal workers, which creates a hidden and unacceptably high safety risk.

Normally, healthy root systems resemble the spokes of a bicycle wheel, growing away from the trunk of the tree and strengthening the integrity and balance of the tree as it grows larger. The most common type of girdling occurs in trees that were forced to grow in a container. Often referred to as "pot-bound" plants, these trees may never develop a healthy or thriving root system, even after being transferred to an open space. Tangential girdling is the first type of abnormal compression and involves one root that is growing up against the side of the trunk. The most damaging type of girdling is girdling of the stem, when the roots have begun to stack themselves against the tree's trunk at varying depths. The third type is a complete encircling of the trunk by multiple roots. Planting too deeply or forming mulch volcanoes both contribute to the risk of developing girdled roots, while planting with the stem completely above ground significantly lowers the risk. Any practice of planting or housing that places the trunk of the tree below ground creates the strong possibility of girdled roots.

Girdled roots may be prevented by proper planting. Be sure not to plant too deeply, when doing so not only makes the tree susceptible to girdled roots, but also places the tree at risk for insect and fungal infections. Inspect trees confined in containers and burlap balls to ensure that their depth in soil to the first branch roots is at a proper level. If you determine that the roots are not yet in contact with the stem, they may be pruned away and prevented from causing compression. If removing the assailant roots requires more than ordinary hand tools, it is suggested by the University of Minnesota that you contact a tree-care professional.

Some examples of girdled root systems:



Community Forestry 2010 Award Winners

This year's Shade Tree Federation Meeting was a tremendous success. During the banquet evening, awards were bestowed upon those who have made triumphant steps for the sake of forestry. Their dedication and perseverance are to be noted and remembered. For those who were not in attendance at the awards ceremony, here is a re-cap of those exemplary individuals and towns. For more information, please visit www.njstf.org

Stephen M. Chisholm, CTE #248

Steve is the owner-operator of Aspen Tree Experts, a family business in Jackson, NJ, with his wife and two sons. He is currently the President of the Board of Certified Tree Experts and an active member of the Committee for the Advancement of Arboriculture (CAA). He is former Vice-Chair and now Chairs the Community Forestry Council. He has served on state and national arboriculture safety committees. Mr. Chisholm's son has also won multiple state, national and international tree climbing championships.

While many participated, Steve spearheaded the 2010 Licensed Tree Expert legislation. Steve works tirelessly to champion safety within the tree care industry. He was also instrumental in ensuring that crane operating safety in tree care was recognized at both the state and national levels.

This widely recognized leader in his field is also the Chair of the Jackson Shade Tree Commission. Steve stood fearlessly in the forefront of the fight to save and institute an unprecedented tree protection ordinance that was ultimately upheld by the New Jersey Supreme Court.

William R. Comery, CTE #501

Bill is the former Director of the Paramus Shade Tree and Parks Department which under his direction established its own fully operational tree nursery to supplement their community forest. Paramus continues to be widely recognized as having a model community forestry program.

Mr. Comery is currently the Vice-Chair of the New Jersey Community Forestry Council and a board member as well as former President of the New Jersey Shade Tree Federation. Bill has for many years freely given his time and expertise to countless neighboring communities and to communities across New Jersey to further the efforts of urban forestry in the Garden State.

As Chair of the Legislative subcommittee of the New Jersey Community Forestry Council, Bill directed the fight to save the dedicated license plates including Treasure Our Trees. He also played a critical role in establishing the Licensed Tree Expert law. Bill's tireless interaction and communication with legislative leaders was absolutely essential to the successful passing of the Licensed Tree Expert Act.

Haddon Township

Haddon Township is a charming community of almost 15,000 residents in Camden County that has made great strides in the development and implementation of their community forestry program. Originally incorporated in 1865, Haddon Township's relationship with the New Jersey Community Forestry Program began in 2007 with the approval of their initial Community Forestry Management Plan.

Led by Chairperson Robert Herbstritt, Haddon Township has progressed into a leader in community forestry and is an example for other municipalities to follow. Realizing a need and seizing an opportunity, Haddon set about writing their initial Community Forestry Management Plan with high hopes to maximize the benefits their tree resources provide for residents with a mission to sustainably manage it for both current and future generations. With the plan's approval, a program began to take shape with the creation of an official Shade Tree Commission in 2008.

The program has continued to lead by example through the constant improvement and creation of innovative opportunities to communicate and educate, such as their development of a sidewalk brochure for residents and contractors to ensure proper practices are being followed. In addition to their success under the New Jersey Shade Tree and Community Forestry Assistance Act, Haddon Township has been an active participant in the Tree city USA program for seven years.

Bernardsville Borough

Bernardsville Borough is recognized for their fantastic achievements in community forestry. Led by Co-Chairs Lou Matlack and Ann Wazeter, Bernardsville Borough has been active with a passion and vision since 2001 when their initial Community Forestry Management Plan was approved. As a delightful municipality of 7,400 residents in Somerset County, Bernardsville Borough has continued to present itself as a leader in community forestry.

Bernardsville has consistently exceeded the requirements for Approved Status under the New Jersey Shade Tree and Community Forestry Assistance Act. This historic borough exemplifies commitment to its mission to ensure the health, safety and sustainability of the municipal tree resource. They have shown a willingness to face new challenges and greet them was opportunities to carry on towards their goal. This is especially evident with their interest and work relating to tree inventories and their currently ongoing project to identify and mitigate hazardous trees in the municipality especially by taking the extra step to include school properties in the assessments utilizing funding from the federal Business Stimulus Fund.

Tree City USA designation is earned by meeting several established criteria and bestows nationwide recognition. Bernardsville at the 2010 Shade Tree Federation Meeting celebrates their 20th year as a Tree City.

Salt and Chemical Tolerance in Street Trees

Written by Mary Ferraro, Regional Forester

Based on the University of Colorado website and Diseases of Shade Trees *by Terry A. Tattar*

A large number of chemicals used by people are toxic to plants but in the winter it is the deicing chemicals that can do the most harm to our trees. Sodium chloride (NaCl) and calcium chloride (CaCl2) are the two most commonly used to melt ice and snow. They are sometimes applied together but the less expensive sodium chloride is used most commonly. Abrasives such as sand, cinders, and washed stone are often added to the salt. The more difficult to handle calcium chloride is used at temperatures below 20°F because it releases heat when it contacts water and can melt ice and snow at much lower temperatures than can sodium chloride.

Magnesium chloride (MgCl2) is also more expensive than sodium chloride and it too will cause burnt leaf margins and needle tips. Magnesium chloride aerosol can be found as much as 300 feet from a highway and its impacts on trees, including reduced photosynthesis, may not be seen for two years.

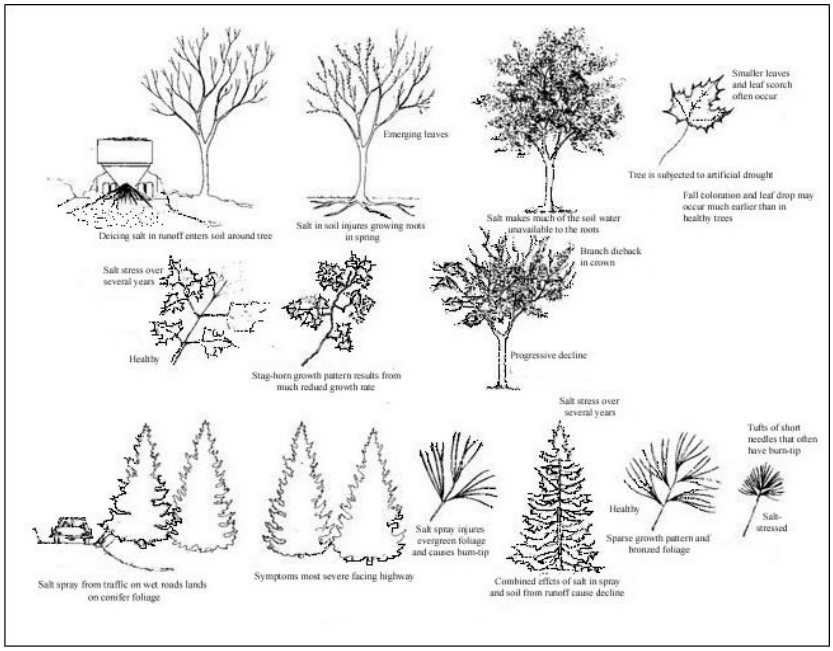
As much as a ton of salt/mile/storm is applied in the northeast on a two-lane highway. This salt in runoff can enter the soil around roadside trees. Salt spray from traffic and storm winds will coat evergreens and the stems and branches of all woody plants. The exact effects are complex but the salts are known to make water and essential nutrients difficult to absorb by the roots.

A tree in salty soil must use more energy to absorb the tightly held water. This condition of a salt-induced water deficit is sometimes called a "physiological drought" because the water in the soil is unavailable to the tree. The roots may respond by absorbing salt in an attempt to balance the soil vs. root salt concentrations thereby allowing water to be absorbed. This trick is used by some salt tolerant plants but can be deadly when attempted by a salt sensitive tree species. These trees expend so much energy to do this that they stop growing, decline, and eventually die.

Both sodium and chloride ions have been shown to be toxic at high enough concentrations. Trees need to absorb potassium and phosphorus from soil but these essential nutrients can be blocked by high levels of sodium and chlorides respectively.

Chemicals in salt spray can enter plants in the winter and injure evergreens as well as buds on twigs and branches with thin bark. More damage is usually seen on the side facing the road resulting in a tree that only grows on the side facing away from the spray.

Below: multiple examples of salt injury and its progression.
Illustration courtesy of Diseases of Shade Trees, by Terry A. Tattar



Salt Tolerance, continued...

The most common symptoms of high salt concentration in the soil include early fall coloration and early leaf drop, small leaves, heavy seed load, progressive dieback, and dead spots between the leaf veins. Salt toxicity often causes tip or marginal dead areas as well. These trees may also be more sensitive in a drought or when especially cold.

Salt Sensitive and Tolerant Shade Trees

Salt Tolerant		Salt Sensitive
EVERGREEN	Burr oak	EVERGREEN
American holly	Downy serviceberry	Douglas fir
Austrian pine	English oak	Eastern white pine
Colorado blue spruce	Golden willow	Red pine
Eastern red cedar	Green ash	DECIDUOUS
Japanese black pine	Hackberry	American elm
Pitch pine	Honey locust	American linden
White spruce	Quaking aspen	Boxwood
Yews	Red oak	Ironwood
DECIDUOUS	Russian olive	Little-leaf linden
Allegheny service-berry	Siberian crabapple	Red maple
Big tooth aspen	Siberian elm	Shagbark hickory
Black cherry	Shadblow service-berry	Silver maple
Black locust	Sycamore maple	Sugar maple
Box elder	Weeping willow	
	White oak	
	White poplar	

Accurate diagnosis depends on chemical analyses of both the soil and tree tissue samples. The best way to avoid this injury is to protect the trees and their roots from the spray and salty runoff. Trees need to be al least 30 feet from the highway. Plywood, burlap, tar paper, and plastic have been used successfully to build temporary screens while construction of ditches to carry runoff away from trees will also help. Application of antidesiccants on evergreens has been shown to decrease salt spray injury.

Affected trees can be treated by leaching the salt from the soil with fresh water any time when the ground is not frozen but is most effective soon after a period of salt contamination. Removal of salt in early spring will allow a better flush of root and shoot growth. Several water applications may be needed depending on original levels. Similarly, salt on foliage from spray can also be removed with fresh water and the sooner the better.

Activated charcoal has been recommended to help neutralize salts in the soil. It should be carefully worked into the top six inches under the drip line as soon as possible. Gypsum seems to work on heavier soils when applied to the soil surface at the rate of 100 lbs/1,000 sq ft.

Only salt tolerant trees should be planted in areas where salt is likely to contact them.

Quick Quips: Fun Facts and News Items of Interest

From the United States Forest Service:

Betty White, known for her long career as a beloved comic actress and for her fondly remembered roles in such television shows as "The Golden Girls," has received the award of Honorary Forest Ranger, bestowed upon her by the U.S. Forest Service. White's lifelong dedication to protecting wilderness and wildlife was recognized in ceremony and can be viewed through the Forest Service's video posted on YouTube at the following:

http://www.youtube.com/user/usdaForestService?feature=mhum#p/a/u/0/n7BP_ZmbFwA

New Jersey Department of
Environmental Protection
Division of
Parks & Forestry
Forest Service

Community Forestry Program
501 E. State St. Mail Code 501-04
P.O. Box 404
Trenton, NJ 08625-0404
PHONE (609) 292-2532
FAX (609) 984-0378

Blackwells Mills Field Office
PHONE (732) 873-3051
FAX (732) 873-1574

WEB SITES
www.communityforestry.nj.gov
www.TreasureOurTrees.com